

Preliminary Amendment

Applicant: Christian Birzer; Jens Pohl

Serial No.: Unknown

(Priority Application No. DE 10 2004 005 586.6)

(International Application No. PCT/DE2005/000175)

Filed: Herewith

(Priority Date: February 4, 2004)

(International Filing Date: February 3, 2005)

Docket No.: I431.167.101

Title: SEMICONDUCTOR DEVICE HAVING A CHIP STACK ON A REWIRING PLATE (as amended)

IN THE CLAIMS

Please cancel claims 1-10 without prejudice.

Please add claims 11-32 as follows:

Patent Claims WHAT IS CLAIMED IS:

11. (new) A semiconductor device comprising:

a semiconductor chip stack on a rewiring plate, the underside of the rewiring plate forming the underside of the semiconductor device;

an external contact area having a plurality of external contact area regions which are physically separate from one another being arranged on the underside;

the individual external contact area regions being assigned to the individual semiconductor chips in the semiconductor chip stack; and

the regions of an individual external contact area being electrically connected via a common external contact.

12. (new) The semiconductor device of claim 11, wherein the rewiring plate comprises, on its top side, a rewiring structure which comprises, in the center of the rewiring plate, contact pads for connecting a semiconductor chip to flip-chip contacts and comprises, in the edge region, contact pads for bonding connections to a stacked semiconductor chip.

13. (new) The semiconductor device of claim 11, wherein the rewiring plate comprises, in the center of its top side, a rewiring structure for fitting the rear side of a lower semiconductor chip and comprises, in the edge regions, contact pads for bonding connections to top sides of the stacked semiconductor chips.

14. (new) The semiconductor device of claim 11, wherein the rewiring plate comprises through-contacts via which the contact pads on the top side of the rewiring plate are connected to the external contact area regions on the underside of the rewiring plate.

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15. (new) The semiconductor device of claim 11, wherein the rewiring plate comprises rewiring lines which connect the external contact area regions to the contact pads.

16. (new) The semiconductor device of claim 11, wherein the semiconductor chips of the semiconductor device comprise, on their active top sides, contact areas which are connected, via flip-chip contacts and/or bonding connections, to the contact pads on the top side of the rewiring plate.

17. (new) The semiconductor device of claim 11, wherein the semiconductor chip stack on the rewiring plate is embedded in a plastic composition.

18. (new) A panel which comprises device positions which are arranged in rows and columns and have semiconductor devices of claim 11.

19. (new) A semiconductor device comprising:

a semiconductor chip stack on a rewiring plate, the underside of the rewiring plate forming the underside of the semiconductor device;

an external contact area having a plurality of external contact area regions which are physically separate from one another being arranged on the underside;

the individual external contact area regions being assigned to the individual semiconductor chips in the semiconductor chip stack; and

the regions of an individual external contact area being electrically connected via a common external contact;

wherein the rewiring plate comprises, on its top side, a rewiring structure which comprises, in the center of the rewiring plate, contact pads for connecting a semiconductor chip to flip-chip contacts and comprises, in the edge region, contact pads for bonding connections to a stacked semiconductor chip, and wherein the rewiring plate comprises

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through-contacts via which the contact pads on the top side of the rewiring plate are connected to the external contact area regions on the underside of the rewiring plate.

20. (new) The semiconductor device of claim 19, wherein the rewiring plate comprises rewiring lines which connect the external contact area regions to the contact pads.

21. (new) The semiconductor device of claim 20, wherein the semiconductor chips of the semiconductor device comprise, on their active top sides, contact areas which are connected, via flip-chip contacts and/or bonding connections, to the contact pads on the top side of the rewiring plate.

22. (new) The semiconductor device of claim 21, wherein the semiconductor chip stack on the rewiring plate is embedded in a plastic composition.

23. (new) The semiconductor device of claim 22, wherein the rewiring plate comprises, on its top side, a rewiring structure which comprises, in the center of the rewiring plate, contact pads for connecting a semiconductor chip to flip-chip contacts and comprises, in the edge region, contact pads for bonding connections to a stacked semiconductor chip.

24. (new) A method for producing and testing a panel having semiconductor device positions which are arranged in rows and columns and have semiconductor chip stacks, the method comprising:

producing a circuit carrier in the form of a rewiring plate having rewiring lines which electrically connect, via through-contacts, contact pads on the top side of the circuit carrier to external contact area regions on the underside of the circuit carrier, the external contact area regions being patterned in such a manner that a plurality of external contact area regions are provided for the purpose of fitting an external contact;

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applying a stack of semiconductor chips to the circuit carrier with connection of contact areas of the semiconductor chips to contact pads on the top side of the circuit carrier; covering the circuit carrier with a plastic composition in the region of the semiconductor device positions; testing each individual semiconductor chip in a semiconductor chip stack using the corresponding external contact area regions on the underside of the circuit carrier; and marking defective semiconductor devices.

25. (new) The method of claim 24, comprising:

applying external contacts to the external contact area regions with electrical connection of the external contact area regions; and separating the panel into individual semiconductor devices.

26. (new) A semiconductor device comprising:

a semiconductor chip stack on a rewiring plate, the underside of the rewiring plate forming the underside of the semiconductor device; means for providing an external contact area having a plurality of external contact area regions which are physically separate from one another being arranged on the underside; the individual external contact area regions being assigned to the individual semiconductor chips in the semiconductor chip stack; and the regions of an individual external contact area being electrically connected via a common external contact.

27. (new) The semiconductor device of claim 26, wherein the rewiring plate comprises, on its top side, a rewiring structure which comprises, in the center of the rewiring plate, contact pads for connecting a semiconductor chip to flip-chip contacts and comprises, in the edge region, contact pads for bonding connections to a stacked semiconductor chip.

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28. (new) The semiconductor device of claim 26, wherein the rewiring plate comprises, in the center of its top side, a rewiring structure for fitting the rear side of a lower semiconductor chip and comprises, in the edge regions, contact pads for bonding connections to top sides of the stacked semiconductor chips.

29. (new) The semiconductor device of claim 26, wherein the rewiring plate comprises through-contacts via which the contact pads on the top side of the rewiring plate are connected to the external contact area regions on the underside of the rewiring plate.

30. (new) The semiconductor device of claim 26, wherein the rewiring plate comprises rewiring lines which connect the external contact area regions to the contact pads.

31. (new) The semiconductor device of claim 26, wherein the semiconductor chips of the semiconductor device comprise, on their active top sides, contact areas which are connected, via flip-chip contacts and/or bonding connections, to the contact pads on the top side of the rewiring plate.

32. (new) The semiconductor device of claim 26, wherein the semiconductor chip stack on the rewiring plate is embedded in a plastic composition.